Remarks

The Office Action mailed April 28, 2004, has been carefully reviewed and the foregoing amendment has been made in consequence thereof.

Claims 15-20 and 29-42 are now pending in this application. Claims 15-18, 20, 30-33, 37, 39, and 42 stand rejected. Claims 29 and 38 stand objected to. Claims 19, 34-36, 40, and 41 are withdrawn from consideration as directed to a non-elected invention.

The rejection of Claim 31 under 35 U.S.C. § 112, second paragraph, is respectfully traversed.

Claim 31 has been amended to more clearly provide antecedent basis for the recitations and to clarify the invention. It is believed that how the noted conditions in the Office Action can exist simultaneously is now clear.

Applicant accordingly respectfully requests that the Section 112 rejections of Claim 31 be withdrawn.

The rejection of Claims 15-18, 20, 30-33, 37, 39, and 42 under 35 U.S.C. § 103 as being unpatentable over Mollet (U.S. Patent No. 5,280,261) in view of Baird et al. (U.S. Patent No. 3,601,737) or in view of Rybka et al. (U.S. Patent No. 6,160,471) is respectfully traversed.

Mollet describes a current limiting fuse (10) with a tubular shaped fuse body (50) and metallic end caps (30, 31) fitted over the ends of body (50). A fuse link (20) is electrically connected to caps (30, 31) and an arc quenching material (i.e. silica sand (41)) is dispersed within body (50). Link (20) includes a plurality of weak spots (63), each with an aperture (60) and two notches (65). Link (20) includes bends (40) at spaced intervals, each of the bends (40) coming into contact with an interior wall of body (50) at two different places, causing an interaction between bends (40) and the interior wall during arcing to enhance the arc quenching

characteristics of fuse (10). See Mollet Column 2, lines 6-28 and lines 40-54. See Mollet also Column 3, lines 3-13.

Baird et al. describe a current limiting fuse with a tubular insulative casing (2) whose opposite ends are closed by disc-shaped terminals (3). Casing (2) is filled with a pulverulent arc quenching material (5). Spanning the terminals (3) inside casing (2) and embedded in material (5) is a fuse element (1) which is made of an elongated, ribbon-like silver link (6) and an elastomeric arc-constricting body (7) made of silicone rubber. Link (6) includes a plurality of serially related, laterally opposing notches (8), the number of which determine the voltage rating of the fuse, the notches also creating portions (9) of reduced cross-sectional area. Structures (7) are located around one or more of portions (9) precluding creation of conductive fulgurite at these regions. Such structures or bodies (7) encapsulate and surround substantially all surfaces in reduced portion cross-sectional areas (9) so that there are no voids or communicative passages to material (5). See Baird et al. Column 2 line 53 to Column 3, line 20.

Rybka et al. describe a fusible link containing structure (100) for an electrical fuse. The structure (100) includes a unitary pair of tabs (118), (120) affixed to a metallic fuse element (102) to block movement of an arc that may originate at a fusible link (106) in fuse element (112). Fusible link (106) includes two lines of orifices (108), (110) placed along either side of a longitudinal center of fuse element (102) to reduce the thickness of the metal in that area. Tabs (118) and (120) are positioned on opposite sides of fusible link (106) and are attached to fuse element (102) in a laminating process. Rybka et al. col. 4, lines 25-62. Notably, the tabs (118), (120) are separated from the weak spots (108), (110) of the fusible link (106) and do not cover the weak spots at all.

As explained by Baird et al., the nature of elastomeric body (7) "tends to confine and constrict the arc which results in a high arc current density and improved arc voltage characteristics." See Baird et al. col. 3, lines 13-15. Undesirable voltage drops are therefore avoided that compromise DC current interruption. Additionally, elastomeric body (7) isolates

fuse element weak spots (9) from arc quenching filler (5), thereby precluding formation of fulgerite at the fuse element weak portions that is believed to create shunt current paths that cause arc voltage to drop. See Baird et al. col. 3, lines 7-12 and col. 1, lines 51-66. It is therefore noted that Baird et al., through the described elastomeric bodies (7), "arc voltage can be maintained at a high level for a sufficient time", which is deemed to be desirable by Baird et al. Indeed, the construction of the fuse described by Baird et al. is designed to prevent voltage drops as the fuse operates.

In contrast, as the present specification makes clear, the fuse of the present invention is designed to *reduce* arc energy and *improve arc extinguishing characteristics* as the fuse operates. As such, the arc energy absorbing coating employed in the present invention is submitted to be fundamentally different in purpose, structure, and effect than elastomeric bodies (7) described by Baird et al. and promoted to maintain high arc voltage and energy for selected time periods The objectives of the present invention are therefore generally contradictory to the teaching of Baird et al., and it is respectfully submitted that one of ordinary skill in the art at the time the invention was made would not look to Baird et al. as suggesting a potential solution to arc energy absorption and arc extinguishing issues.

As such, Claim 15 recites a method of fabricating a fuse where the fuse includes end conductor elements, a fuse element secured between and making electrical contact with the end conductor elements, an elongate fuse housing extending between the end conductor elements, and an arc energy absorbing coating at least partially coating a first and a second end portion of the fuse element. The fuse housing comprises an inside surface defining a passageway extending longitudinally from a first end to a second end of the housing, and the fuse element extends through the passageway. The method comprises "applying the coating to the first and second end portions of the fuse element," "coupling the fuse element to the end conductor elements" and "coupling the end conductor elements to the housing."

Mollet in view of Baird et al. or in view of Rybka et al. do not describe nor suggest a method which includes applying the coating to the first and second end portions of the fuse element. Rather, Baird et al. teach away from the present invention by promoting and maintaining high arc energy via insulating elastomeric bodies surrounding weak spots of the fuse link. There is no indication that the weak spots of Baird et al. are located at the end portions of the fuse element, as recited in Claim 15. Additionally, Baird et al. teach away from the claimed invention as, at Column 3, lines 1-12, Baird et al. describe that the arc constricting body (7) is in immediate contact with substantially all surfaces of the reduced portion of the fuse link. Rybka et al. describe arc blocking tabs separated from, and not incompletely covering, the weak spots of a fusible link. In addition, there is no indication that the arc blocking tabs of Rybka et al. are located at the end portions of the fuse element, as recited in Claim 15.

For the reasons set forth above, Claim 15 is submitted to be patentable over Mollet in view of Baird et al. or in view of Rybka et al.

Claims 16-18, 20, and 30-33, depend, directly or indirectly, from independent Claim 15. When the recitations of Claims 16-18, 20, and 30-33 are considered in combination with the recitations of Claim 15, Applicant submits that dependent Claims 6-18, 20, and 30-33 likewise are patentable over Mollet in view of Baird et al. or in view of Rybka et al.

Claim 37 recites a method of fabricating a fuse where the fuse includes end conductor elements and a fuse element having first and second end portions, the fuse element secured between and making electrical contact with the end conductor elements within a fuse housing. The method comprises "applying an arc energy absorbing coating to the first and second end portions of the fuse element while leaving a center portion of the fuse element between the first and second end portions free from said coating," "positioning the fuse element within the housing" and "electrically connecting the fuse element to the end conductor elements."

Mollet in view of Baird et al. or in view of Rybka et al. do not describe nor suggest a method which includes applying an arc energy absorbing coating to the first and second end

portions of the fuse element. As described above, there is no indication that the weak spots of Baird et al. are located at the end portions of the fuse element, and there is no indication that the arc blocking tabs of Rybka et al. are located at the end portions of the fuse element.

For the reasons set forth above, Claim 37 is submitted to be patentable over Mollet in view of Baird et al. or in view of Rybka et al.

Claims 39 and 42 depend, directly or indirectly, from independent Claim 37. When the recitations of Claims 39 and 42 are considered in combination with the recitations of Claim 37, Applicant submits that dependent Claims 39 and 42 likewise are patentable over Mollet in view of Baird et al. or in view of Rybka et al.

For the reasons set forth above, Applicant respectfully requests that the Section 103 rejection of Claims 15-18, 20, 30-33, 37, 39, and 42 be withdrawn.

The objection to Claims 29 and 38 is respectfully traversed. Claims 29 and 38 depend from independent Claims 15 and 37 respectively, and which are herein submitted to be patentable over the cited art. For the reasons set forth above, Applicant requests that the objection to Claims 29 and 38 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,

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